

WO 2004/030533

PCT/GB2003/004331

15

Claims

1. An apparatus for monitoring a patient, comprising an invasive optical sensor device for monitoring substantially continuously a parameter relating to a bodily fluid of the patient and an analyser device in communication with the sensor device for analysing a sample of bodily fluid withdrawn from the patient to derive information relating to the sample of bodily fluid.
2. An apparatus according to claim 1, in which the information relating to the sample of bodily fluid is the parameter monitored by the sensor device.
3. An apparatus according to claim 1 or claim 2, the apparatus being so arranged that information derived by the analyser device can be compared with measurements made by the sensor device.
4. An apparatus according to claim 3, in which the measurements made by the sensor device are recorded and information derived by the analyser relating to a sample can be compared with a measurement made by the sensor device substantially contemporaneously with the withdrawal of that sample.
5. An apparatus according to claim 3 or claim 4, in which comparison of the data from the analyser device with data from the sensor device can be used for calibration and/or re-calibration of the sensor device.

WO 2004/030533

PCT/GB2003/004331

6. An apparatus according to claim 5, which is arranged to effect automatic calibration and/or re-calibration of the sensor device when a difference between a value determined by the sensor device and a value determined by the analyser device is calculated on said comparison to be outside a target tolerance range.
- 5 7. An apparatus according to claim 5, in which the data from the sensor device and the data from the analyser device is displayed and the calibration and/or re-calibration can be effected manually.
- 10 8. An apparatus according to any one of claims 1 to 7, which comprises a withdrawal device for withdrawing a sample for analysis by the analyser device.
9. An apparatus according to claim 8, which is arranged to withdraw samples at predetermined intervals.
- 15 10. An apparatus according to claim 8 or claim 9, which is arranged to withdraw samples at regular intervals.
11. An apparatus according to any one of claims 8 to 10, in which the samples can be withdrawn through a probe of the sensor device.
- 20 12. An apparatus according to any one of claims 1 to 11, in which the probe of the sensor device is suitable for insertion into, and the analyser is arranged for analysis of blood from, a blood vessel.
- 25 13. An apparatus according to any one of claims 1 to 12, in which the sensor device is an optical sensor device of the type which detects changes in the spectroscopic

WO 2004/030533

PCT/GB2003/004331

characteristics of a sensor substance which is contained in the sensor device.

14. An apparatus according to any one of claims 1 to 13, in which the sensor device and the analyser device are each arranged to determine a plurality of parameters.
- 5 15. An apparatus according to any one of claims 1 to 14, in which the analyser device and the sensor device are each able to monitor concentration of at least one blood analyte.
- 10 16. An apparatus according to claim 15, in which the analyser device and the sensor device are each able to monitor at least one blood gas.
17. An apparatus for monitoring a patient substantially as described herein with reference to and as illustrated 15 by Fig. 1.
18. A method of calibrating and/or recalibrating an invasive optical sensor device comprising monitoring substantially continuously a parameter relating to a bodily fluid of the patient using the sensor device, 20 analysing a sample of that bodily fluid in an analyser device, comparing an analysis result obtained by the sensor device with an analysis result obtained by the analyser device, and effecting adjustment of data relating to the sensor device in dependence upon the 25 comparison.
19. A method according to claim 18, in which said adjustment is effected automatically.

WO 2004/030533

PCT/GB2003/004331

20. A method according to claim 18, in which said adjustment is effected manually.
21. A method according to any one of claims 18 to 20, in which the history of the substantially continuous 5 measurements is recorded, and the comparison is effected with the value of the substantially continuous measurement that obtained at the time of taking of the sample.
22. A method according to any one of claims 18 to 20, in 10 which samples of the bodily fluid are withdrawn and analysed at intervals.
23. A method according to claim 22, in which the samples are withdrawn and analysed at predetermined intervals.
24. A method according to claim 22 or claim 23, in which 15 samples are withdrawn and analysed at regular intervals.
25. A method according to any one of claims 18 to 24, in which at least one parameter selected from pO_2 , pCO_2 , pH is measured by the sensor device and the analyser device.
26. A method of calibrating an invasive optical sensor device substantially as described herein.